Building Code Considerations for Warehouse, Manufacturing, Storage

(Valid for 2016, Check for Annual Updates)

Beaverton has a significant number of large open warehouse type buildings. Many of these buildings were designed to be used for storage, manufacturing, packaging, assembly and similar uses. Businesses that are contemplating moving into a building within the City of Beaverton of this type need to be aware of a number of things related to City and State Codes. City staff are available to meet informally or through a pre-application meeting prior to design/construction in order to offer feedback, etc.

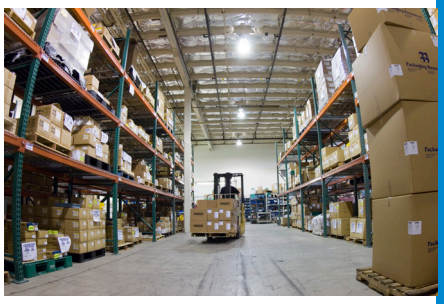
Business Assistance: If you would like assistance finding a location, starting your business, or learning about resources available to businesses in Beaverton, please contact the Economic Development Division 503-526-2456. http://www.beavertonoregon.gov/EconomicDevelopment

Land Use and Zoning: The first thing a business owner needs to do is verify that their specific business is compatible with the zoning of the property. This can be done by contacting the City of Beaverton Planning Division to determine the allowed business uses at the specific property. Please call 503-526-2420. http://www.beavertonoregon.gov/Planning

City Business License: Each business is required to have a valid City Business License. Business licenses can be obtained through the City Finance Department. For more information, please call 503-536-2255. http://www.beavertonoregon.gov/BusinessLicense

Building Plan Review and Permits: For information on building permit applications, plan review requirements and fees, etc., please call 503-526-2403. http://www.beavertonoregon.gov/Building

State Building Code: The current State Building Code (SBC) includes: The 2014 edition of the Oregon Structural Specialty Code (OSSC); 2014 Oregon Mechanical Specialty Code (OMSC); the 2014 Oregon Plumbing Specialty Code (OPSC); the 2014 Oregon Electrical Specialty Code (OESC); and the 2014 Oregon Fire Code (OFC). To review these codes on-line, please go to: http://www.cbs.state.or.us/external/bcd/programs/online_codes.html



BUILDING CODE INFORMATION

The information listed below are specific SBC Requirements. For more information about how these requirements apply to warehouse, manufacturing, and storage business uses, please contact the Building Division, 503-526-2403.

Storage Racks/Shelving, Equipment: Where storage racks and/or shelving, or equipment are to be installed, they must meet a number of building/fire code requirements:

- Storage racks, shelving and equipment must be anchored to the floor to resist falling over during an earthquake. The anchorage may also resist tipping of the rack/shelves in areas where contact from forklifts or similar equipment is present. Since most single story warehouse building have a concrete floor, anchorage is typically by bolts installed in the concrete. Racks/shelving that are required to be mobile (on wheels/rollers) for moving materials from one area to the next as part of the business process, are not required to be anchored.
- An engineer is required to determine the size and spacing of the anchors based on the loads of the rack/shelves or equipment.
- Typically, anchors for racks/shelves less than 6 feet tall do not need an engineered design but do need to be anchored. The size and spacing of the anchors will need to be provided to the City Building Division for approval. Most anchors (bolts) installed in concrete require the installation to be 'special inspected' (special inspection is required by the Building Code to be performed by a third-party firm due to the specialized requirements for installing the bolts).
- Storage racks and shelving over 8 feet tall must also be designed for structural capacity to support the load of the stored material. The plans/calculations for racks and shelving must be completed by a design professional (typically an engineer). This includes racks/shelving that are being moved from one location to a new location.

High Pile Combustible Storage: Depending on the type and at what height the material is being stored on the racks/shelves, additional fire protection may be required. The storage of materials (including packaging and pallets) that are combustible at 12 feet or greater above the floor (6 feet for highly combustible/flammable materials) is considered High Pile Combustible Storage (HPCS) and must meet the requirements of the Fire Code Chapter 32. Most often a design professional (such as a Fire Protection Engineer) is needed to determine much of the High Pile Requirements). HPCS requirements include:

- Determining the types of materials (known as commodities) and their hazard classification from the Fire Code. Commodities include packaging material, pallets, and containers.
- Determining the size of the high pile storage area. The larger the area that is used for HPCS the more fire protection requirements there are. See Table 3206.2 of the Fire Code).
- An automatic fire sprinkler system. With the exception of very small areas of HPCS, automatic fire sprinkler systems throughout the building is required. Note: not all warehouse buildings were designed for HPCS, and therefore, may not have been equipped with an automatic fire sprinkler system (see also the automatic fire sprinkler system design).
- The automatic fire sprinkler system design. Not all automatic fire sprinkler systems are the same. Some are designed to discharge more water, depending on the level of fire hazard in the building. Where HPCS is present, the amount of water (known as the design density) will need to be verified as adequate for the type(s) of commodities stored. This information is typically provided by a fire sprinkler contractor.
- Automatic Fire Detection Systems. Some HPCS areas require an automatic fire detection system throughout the building.

- Building Access. Some HPCS requires an access doors (for fire fighter access) at 100 foot intervals.
- Smoke and heat vents. HPCS require the roof to have smoke and heat removal vents.
- Draft Curtains. Some HPCS require draft curtains. Draft curtains are typically sheet rock or sheet metal that hangs four to six feet down from the roof/ceiling to break up the roof into segments that contain smoke and heat from spreading over the entire roof/ceiling area.

Equipment Anchorage: Equipment that weighs over four hundred pounds (and is elevated 4 feet or less above the floor) must also be anchored or otherwise prevented from moving in an earthquake. This is to prevent the equipment from damaging the building structure and blocking exit paths.

- Typically, equipment that is elevated over 4 feet above the floor and weighs more than 75 pounds is required to be designed for both vertical and lateral (earthquake) loads. This is to ensure the building structure can support the weight; that the equipment is supported correctly; and can resist movement in an earthquake that could cause it to collapse.
- Typically the equipment is anchored by bolts similar to that of racks.
- An engineer is required to determine the size and spacing of the anchors based on the weight of the equipment. The size and spacing of the anchors will need to be provided to the City Building Division for approval. Most anchors installed in concrete require the installation to be 'special inspected' (special inspection is required by the Building Code to be performed by a third-party firm due to the specialized requirements for installing the bolts).
- Equipment that are required to be mobile (on wheels/rollers) for moving the equipment/material from one area to the next as part of the business process, are not required to be anchored.
- Equipment that because of its special nature cannot be directly anchored to the floor (vibration sensitivity, etc…) can be corralled by angle-iron and bolted to the floor (or similar) to allow the equipment to move, but not endanger the structure or exit paths.

Hazardous Materials: Hazardous materials are chemicals or materials that are flammable, combustible, explosive, corrosive, cryogenic and/or toxic. Some businesses store/use hazardous chemicals or materials as part of their operation.

- The types and quantities of the hazardous chemicals or materials must be provided (as determined form the Material Safety Data Sheets, also known as MSDS Sheets) and how they are used (such as stored, used from open container or used from containers through a closed system).
- If the quantities of the hazardous chemicals or materials do not exceed the limits allowed by the Building Code Tables 307.1(1) and/or 307.1(2) they can be allowed in the building without many additional requirements (see separation from other businesses). The quantities of the hazardous chemicals or materials can be increased where additional fire protection is provided (such as automatic fire sprinklers, storage in approved fire cabinets, storage use on fire rated rooms).
- If the quantities of the hazardous chemicals or materials exceed the limits allowed by the Building Code Tables 307.1(1) and/or 307.1(2) the building must meet all the requirements of a hazardous use building.
- If business that stores/uses hazardous chemicals or materials (even if under the quantity limits) is located in a building with other businesses (multiple lease space buildings), that business must be separated from the other businesses by fire rated walls.

Woodworking or Dust Producing Business: Business operations that generate combustible dust or fibers (such as woodworking, paper/cardboard recycling, flour mills, etc…) require a hazardous exhaust system.

- Woodworking or dust producing operations. Woodworking or dust producing operations are required to comply with the Mechanical Code Sections 510.2.1 and 511, as well as Fire Code Sections 1903.2, 1304.1 and 911.
- Mechanical Code Section 510.2.1 requires Woodworking or dust producing operations facilities to be provided with an approved dust-collection and exhaust system. The equipment used to collect and convey the combustible dusts shall be provided with an approved explosion-control system. Fire Code Section 2803 may require explosion venting.
- Mechanical Code Section 511 requires the dust collection system to be located outside the building. Collectors such as 'Point of Use' collectors may be installed indoors provided they are installed in accordance with Table 1304.1 of the Fire Code, NFPA 654 and 664, the Electrical Code and the systems are listed/approved by a nationally recognized testing agency, such as Underwriters Laboratories (U.L.). Collectors in independent exhaust systems are limited to three independent collectors, serving not more than five dust producing appliances and installed in accordance with Table 1304.1 of the Fire Code, NFPA 654 and 664, the Electrical Code and listed/approved.

Heating/Cooling: Many warehouse type buildings were not designed to be heated or cooled (only heat to protect water pipes from freezing). If a business needs an uninsulated space to be heated and or cooled (beyond freeze protection), the space will need to be insulated to the current energy code.

Accessibility (Americans with Disabilities Act (ADA)): Any alterations to a building or space (new walls, rooms, doors, bathroom, etc...) will need to meet the accessibility code requirements from Chapter 11 of the SBC. In addition, Chapter 34 of the SBC requires any ADA barriers that exist elsewhere in the building to be removed at a cost not to exceed 25 percent of the value of the overall project. For example: if a project has a cost of $20,000 for the new work, up to an additional $5,000 must be spent in removing ADA barriers (if any exist). If it only costs $1,000 to eliminate all the remaining barriers, the whole $5,000 would need to be spent. If there are $10,000 in costs to remove the barriers, only $5,000 would need to be spent. If there are no remaining ADA barriers, then no additional money needs to be spent.

Plumbing Fixtures: Every business must have access to a minimum number of plumbing fixtures (toilets and sinks). Chapter 29 of the SBC is used to determine the minimum number necessary. Depending on the nature of the business, additional fixtures may need to be added.

Fees: Aside from the various permit fees that will be required, new businesses must pay system impact fees or a System Development Charge (SDC). Typically, these are sanitary sewer fees if new plumbing fixtures are added to the space. The SDC fees can be expensive. For example: adding two toilets and two lavatory sinks would require payment of a $5,100 sewer fee. Other fees that may apply could be a transportation (traffic) fee if there is a major change in the use of the building or space (such as going from storage use to retail use).

The information provided is not all inclusive. The details provided serve as an overview of common issues related to the proposed business type. For more information, please contact the appropriate entity noted above.